

Sources of Alchemical Cryptography

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Abstract

This paper presents an initial overview of cryptographic sources relating to alchemy, an area that remains largely unexplored. Alchemists and chymists frequently encrypted short passages relating to recipes and experiments, obscured content using exotic foreign languages or custom shorthand, and created unique symbol codes. A survey of manuscripts reveals the diversity of sources in over 100 instances of ciphering in alchemical contexts, where ciphers were only one of several methods traditionally used to maintain secrecy. It serves as a starting point for further research, demonstrating the wealth of archival material related to alchemical cryptography – a goldmine yet untapped.

1 Introduction

The alchemical tradition is rife with practices of secrecy, but its cryptographic and steganographic habits are not yet well understood. This article builds upon the publication by Lang (2023), which contextualized ciphers within alchemical secrecy techniques. Working within the framework posed by Lang, this survey focuses on the scribal practices of encryption within alchemical secrecy. The current state of the field lacks comprehensive bibliographical information on extant alchemical ciphers discovered in early modern manuscripts, posing a roadblock preventing scholars from a comprehensive understanding of early modern encryption practices and scribal knowledge-production among natural philosophers. This article aims to address this by presenting and contextualizing alchemical ciphers from over 110 manuscript sources located in libraries across 10 countries.¹ This survey is

¹While we acknowledge there exists a plethora of printed examples of encryption, this paper focuses explicitly on

an early attempt to systematically identify sources of alchemical cryptography to lay the groundwork for future scholarship.

2 Literature Review

The realm of alchemical ciphers represents a largely unexplored area in the study of alchemy. These ciphers, though known to some extent within the field, have not been subjected to the comprehensive analysis they merit. Alchemy's communication traditions are deeply embedded in sophisticated secret-keeping methods, with ciphers being just one aspect of these practices. David Kahn's seminal work, *The Codebreakers*, briefly acknowledges the use of enigmatic symbols in astrology and alchemy, noting that, similar to ciphers, these symbols may appear nonsensical but are, in fact, laden with concealed meaning (Kahn, 1996, 91). However, this reference is cursory at best.²

Benedek Láng observes, as others have also noted, that the encipherment methods in alchemy and chymistry seem to operate differently compared to other scientific secrecy techniques (Láng, 2018, 163, 165–166). He points out that only a limited number of ciphers from alchemical texts predating 1600 are documented (Láng, 2018, 165), such as examples from the *Libro del Tesoro* in Madrid, Martin Roesel von Rosenthal's recipes (~1586), the mid-16th century diary of Cluj artisan Johannes Cementes of Kolozsvár, in addition to the ciphers used in the 17th century by chymist Robert Boyle (1627–1691) in his laboratory notebooks (Principe, 1992; Hunter, 2016). Focused research is largely limited to 17th-century

manuscript examples as a particular method of knowledge dissemination with the shared goal of encrypting and decrypting the secrets of nature.

²Agnieszka Rec highlights the scarcity of research on alchemical ciphers, despite their widespread presence in alchemical writings (Rec, 2014).

chymists like Robert Boyle, who publicly championed transparent communication in chymistry.

Alchemists and chymists traditionally used a whole range of methods to hide their knowledge from the uninitiated, often employing multiple layers of technologies of textual concealment. Alchemical secrecy devices can include, but are not limited to, the following types: *Decknamen* and specialist terminology (Newman, 1996), word/name substitution (Principe, 1992), dispersion of knowledge (*dispersio*) across multiple sources (Principe, 1992, 65), *parathesis* and *syncope* (Newman, 1996), monoalphabetic ciphers (Principe, 1992, 67), polyalphabetic ciphers (Bean et al., 2022), trade symbols and codes (Gaede, 2017), alphanumeric knowledge charts (Forshaw, 2005; Clucas, 2017), astrological horoscopes (Piorko et al., 2023), cabbalistic mysticism (Forshaw, 2013), Lullian diagrams (Forshaw, 2013), emblems (Bilak, 2020), (mythoalchemical) allegory (Forshaw, 2020), omitted or enciphered publication information (Purš and Hausenblasová, 2005; Piorko, 2019), pseudonomia (Newman, 1991) or even the use of multiple languages (Principe, 1992).

An intriguing case study is the cipher cast into Emperor Rudolf II's 'Alchemical Hand Bell' (Bean et al., 2023). However, the lack of contextual information makes deciphering this particular cipher challenging, leaving its purpose and solvability uncertain.

The decryption results of an early example of a Bellaso/Porta/Vigenère cipher outside of contemporary cipher manuals indicates specific alchemical secrecy techniques embedded in alchemical scribal culture and textual recipe traditions (Piorko et al., 2023). The discovery and subsequent decryption of the polyalphabetic Bellaso cipher in Sloane MS 1902 published by Bean et al. (2021) is a notable and early instance of this style of encipherment that illustrates the deep knowledge networks inherent in copying, decrypting, and circulating alchemical secrets in the form of a specific encrypted message: *Hermeticae Philosophiae Medulla*. Such scribal networks, which span international manuscript collections, can only be detected through scholarly collaboration. Thus, it is imperative that scholars continue interdisciplinary collaboration to fully grasp the scope of alchemical scribal ciphering.

3 Results: Circulating scribal secrets through encryption

This overview of sources indicates that in alchemical contexts, extensive pages of ciphertext are rare. More commonly, we find short ciphers, single lines, small text blocks, or coded words within recipes. Alchemists also employed other modes of secrecy or obfuscation, including the use of foreign languages like Arabic, Hebrew (quite prevalent), and Latin, which served as obfuscation for the non-erudite (Principe, 2018, 143), though many scholarly alchemists likely had Latin proficiency. They frequently used symbols, not limited to typical alchemical ones, and were inventive in creating their own symbol codes. Shorthand, particularly the Ashmole shorthand (Josten, 1967) found in numerous manuscripts, was widely utilized, likely due to Elias Ashmole's (1617–1692) prolific writing.

Ciphers often relate to alchemical experiments and recipes. In collections featuring multiple authors, certain figures like Paracelsus, Basil Valentine, Roger Bacon, Arnald of Villanova, and other medieval alchemical authorities frequently appear in conjunction with ciphers. This may be due to the large scope of these collections and the finite pool of respected authorities. Paracelsus, for instance, is often associated with ciphered texts because he propagated that there was power in *characteres* (Gannon, 2019, 84).

Cryptographical tradition authors such as abbot Johannes Trithemius (1462–1516), who blended cryptography with occult writings (Gamer, 2022, 1–36), and Giambattista della Porta (1535–1615), known for both alchemy and ciphering (della Porta, 1563; Kodera, 2021), are also commonly mentioned. However, other known cryptographers not engaged in alchemy are less frequently mentioned, with exceptions like John Willis (ca. 1575–1625), whose manual influenced Ashmole's shorthand (Josten, 1967). Ashmole, following the tradition of figures like Dee, showed interest in mathematics and ciphering from a scholarly perspective, suggesting an evolution towards greater cipher literacy (Ellison, 2016) in alchemy.

Regarding existing literature on alchemical ciphers, this survey contributes significantly, revealing several ciphers not previously noted. Benedek Láng, in his broader study of cryptography, mentions only a few known alchemical ciphers (Láng, 2018, 163–166). However, as our survey shows,

alchemical ciphers are more common than previously thought. Rec's assertion of their infrequency in alchemy, due to alchemist's differing intentions (Rec, 2014), is contested here. While they are not as ubiquitous as alchemical *Decknamen* and serve a different function, ciphers are nonetheless a frequent and under-researched aspect of alchemical texts, often overlooked by researchers due to the difficulty in deciphering them without a key or cipher table, and the substantial effort required for decryption.

Alchemical ciphers manifest in diverse forms and complexities, ranging from basic to highly intricate, with some accompanied by their cipher tables and keys, while others are designed to conceal content effectively. Instances where cipher tables seem intentionally corrupted to hinder decryption are notable (Piorko et al., 2023), requiring additional knowledge to rectify such manipulations. The practices of alchemical ciphering likely drew from standard ciphering methods in correspondence and diplomacy, particularly evident in ciphers found in letters, suggesting a cultural overlap with diplomatic or political practices. Alchemy's potential for politics and the economy (Nummedal, 2007) might have influenced the use of ciphers to protect valuable information.

While Benedek Láng points to scientific priority in some instances (Láng, 2018, 163–166), other motivations, like the pursuit of esoteric knowledge, are also significant (Forshaw, 2013). The Dees' work, for example on angel names and Enochian tables, stems from a scholarly pursuit of occult knowledge, incorporating elements from traditions like the Kabbalah (Harkness, 1999; Gannon, 2020). This pursuit aligns with discussions around universal languages (Strasser, 1989; Strasser, 2011), as seen in attempts to create languages like Enochian and the use of Kabbalistic number magic or multilingual ciphering, i.e. using little-known foreign languages as a means of 'encipherment'. In this vein, alchemical ciphering intersects with distinct alchemical techniques of hiding knowledge, such as *Decknamen* or knowledge dispersion. Often, multiple secrecy layers and ciphering are employed together, sometimes combined with visual elements adding to the knowledge transmitted via language.

Cipher tables should also be viewed in relation to other contemporary knowledge tables (Forshaw, 2005; Clucas, 2017), not merely as techni-

cal tools for concealing information. Lang (2023) underscores the multifaceted reasons behind alchemical ciphering, highlighting the need for further research on the topic. An immediate objective for future work is to decrypt and interpret the ciphers listed in this survey, followed by developing a comprehensive taxonomy of alchemical ciphers, as suggested by Lang (2023). Such a taxonomy would elucidate the varied motivations and methods in alchemical ciphering. Future work should also address the use of sympathetic inks in the context of alchemy, which has been noted (Macrakis and Lye, 2014; Macrakis, 2014; Wentrup, 2023), but not yet been the focus of an in-depth study.³

4 Survey: Sources of alchemical cryptography

What follows is an extensive, albeit surely not comprehensive, list of sources containing alchemical ciphers and related secrecy devices.⁴ In order to create this working list of extant materials containing alchemical ciphers, the following collecting institutions were surveyed by the authors between 2016 and 2024:

1. Allard Pierson Library, Amsterdam, NL
2. Embassy of the Free Mind, Amsterdam, NL
3. University Library, Bamberg, Germany
4. State Archive, Bamberg, Germany
5. University Library, Barcelona, Spain
6. State Library, Berlin, Germany
7. State Library, Bremen, Germany
8. University Library, Bremen, Germany
9. University Library, Brescia, Italy

³Macrakis and Lye (2014) mention the use of sympathetic ink following Dorothea Juliana Wallich's (1657–1725) discovery of the element bismuth-cobalt in 1705 (Kraft, 2019): "The cobalt mineral [discovered by Wallich] also displayed remarkable visual qualities: Its color changed from rosy red to grassy green to sky blue when heat was applied. When the cobalt was prepared and turned into a solution with which to write, it was clear, but it produced a fabulous blue-green color when heated. The writing disappeared when cooled (Macrakis and Lye, 2014, 199; cf. 71–72)." Robert Boyle, for instance, also used invisible ink (Macrakis, 2014, 55–58).

⁴While substantial, this contribution cannot address in detail all ciphers known from published literature. This task remains a desideratum. For instance, Timmermann (2015) describes a number of ciphers in Cambridge *alchemica* that are not discussed here. This study is based on physical library visits, focusing on ciphers found in alchemical manuscripts or those pertinent to alchemical contexts. As a result, it uncovers many ciphers that are not widely known and might not be mentioned in bibliographical descriptions, although most are. However, the scope of this work is limited to manuscripts; it does not include printed materials nor does it involve discovering new sources for alchemical cryptography through database searches. These aspects – covering print sources and database exploration – are next steps for future work in this area.

10. Cambridge University Library, UK
11. University Library, Coburg, Germany
12. Royal Library, Copenhagen, Denmark
13. State Archive, Darmstadt, Germany
14. University Library, Darmstadt, Germany
15. State Library, Darmstadt, Germany
16. University Library, Edinburgh, UK
17. Royal College of Physicians Library, Edinburgh, UK
18. National Library (Matenadaran), Erevan, Armenia
19. State Archive, Erfurt, Germany
20. State Archive, Frankfurt am Main, Germany
21. Glasgow University Library, UK
22. Gotha Research Library, Germany
23. Gotha State Archive, Germany
24. State Library, Hamburg, Germany
25. University Library, Hamburg, Germany
26. National Library, Jerusalem, Israel
27. Topkapı Palace Library, Istanbul, Turkey
28. State Library, Kassel, Germany
29. Murhard Library, Kassel, Germany
30. Leiden University Library, NL
31. British Library, London, UK
32. Wellcome Library, London, UK
33. John Rylands Research Library, Manchester, UK
34. University Library, Marburg, Germany
35. State Archive, Meiningen, Germany
36. Russian State Library, Moscow, Russia
37. Russian State Archives of Ancient Documents, Moscow, Russia
38. Roudnice Lobkowicz Library, Nelahozeves, Czech Republic
39. Beinecke Rare Book & Manuscript Library in Yale (New Haven), US
40. National Library, Oslo, Norway
41. Bodleian Library, Oxford, UK
42. National Library, Prague, Czech Republic
43. Strahov Library, Prague, Czech Republic
44. The Accademia dei Lincei in Rome, Italy
45. National Library, Sarajevo, Bosnia and Herzegovina
46. University Library, Sarajevo, Bosnia and Herzegovina
47. State Archive, Rudolstadt, Germany
48. St Andrews University Library, UK
49. Russian State Library, St Petersburg, Russia
50. National Library, Stockholm, Sweden
51. Leopold-Sophien-Library, Überlingen, Germany
52. Marciana Library, Venice, Italy
53. Austrian National Library, Vienna, Austria
54. Herzogin Anna Amalia Library, Weimar, Germany
55. State Archive, Weimar, Germany
56. Herzog August Library, Wolfenbüttel, Germany
57. State Archive, Wolfenbüttel, Germany
58. National Library, Zagreb, Croatia
59. University Library of Zurich, University Library of Zurich, Switzerland
60. Othmer Library, Philadelphia, United States
61. Houghton Library, Cambridge, United States
62. Huntington Library, Pasadena, United States
63. Lehigh University Library, Bethlehem, United States
64. Library Company of Philadelphia, United States
65. Lilly Library, Bloomington, United States
66. Newberry Library, Chicago, United States
67. Van Pelt Library, Philadelphia, United States
68. Memorial Library, Madison, United States
69. New York Academy of Medicine, United States
70. National Library of Medicine, Bethesda, United States

Alchemical ciphers were not found in every collection surveyed.⁵ In the following section, the

⁵However, the following survey includes some libraries

sources found to contain ciphers are listed and described according to country and institution.⁶

4.1 Denmark

4.1.1 Copenhagen National Library

MS. 1717: Circular diagram containing a few letters. 16th Century. Paper. Alchemical miscellany (6 vols) including Thomas Aquinas, *Clavicula Raymundi Lullii cum declaratorio*, Arnald of Villanova, and *Turba Philosophorum*.

MS. 238: Ciphred line close to the spine of the book; three pages with puzzling illustrations and diagrams, amongst which one definitely seems to be a cipher alphabet related to the seven planets/metals. 15th century German *Buch der heiligen Dreyvaltigkeit* [Dreifaltigkeit] with illustrations, dated 1415–1417.

4.2 Germany

4.2.1 Darmstadt Bibliothek

Ms 2625: Page titled ‘Ophir Salomonis’ containing text in Hebrew that may have been used as a means of encryption.⁷ 1746 by Karl Zimmermann.

Ms 3259: Three pages of pigpen ciphertext in a collection of alchemica.

Ms 3266-2 (*Opera philosophica*) Three letter-based cipher tables, two named ‘clavis minor’ and ‘clavis major’ (looking like a Trithemius table); ciphertext using symbols.

that were not thoroughly surveyed but contain single manuscripts with alchemical cryptographic content known to the authors from research literature. These were included to make the list as comprehensive as possible. However, libraries not mentioned above were not extensively surveyed for additional alchemical ciphers they may hold. Furthermore, it is, of course, possible that each of the libraries surveyed contains additional sources of alchemical cryptography we may simply have missed.

⁶A brief investigation revealed that the great majority of these ciphers does not yet seem to be included in the DECODE database (Megyesi et al., 2019; Megyesi et al., 2020; Héder and Megyesi, 2022). We noted the DECODE records in the footnotes where applicable. As hardly any of our examples are from explicitly cryptographic works or contexts, they do not seem to be included in the Shulman bibliography either (Shulman, 1976). Of course, many historical ciphers remain unbroken, suggesting there may be many more ciphers whose alchemical context might only be revealed upon decryption. For instance, letters exchanged between Emperor Ferdinand III and his brother, Archduke Leopold Wilhelm reveal an unexpected level of exchange on alchemical practices amidst the atrocities of the Thirty Years’ War. Notably, extensive sections of these letters detail the progress of alchemical experiments (Soukup, 2023, 52–54). Thus, DECODE record 1579 (<https://de-crypt.org/decrypt-web/RecordsView/1579>) could theoretically relate to alchemical matters as well.

⁷Pseudo Solomonic grimoires such as *Clavicula Salomonis* are discussed in Gannon (2020, 100–101). The Pseudo-Salomonic tradition attempted to implement angel magic using methods and symbols loosely related to the Kabbalah and was popular, for instance, in Rudolphine Prague. Symbols and sigils related to Hebrew, but interpreted as a celestial or angelic script are described in Agrippa of Nettesheim’s *De occulta philosophia*, sometimes under the name of a ‘Malachim script’. Marsilio Ficino also discusses astromagical images in *De vita* – both are sources that would have been known in alchemical circles.

4.2.2 Darmstadt Staatsarchiv

D 4⁸ Nr. 585.1: Cipher alphabet, text passages in Greek and Hebrew. Archival Material of Prince Christian about Rosicrucians, containing *Arcana Collectanea*, *Sperma astrale*, etc., ca. 1730. Mainly late 18th century correspondence of Prince Christian, including alchemical drawings.

D 4 Nr. 588.2: Huge page filled with tiny pigpen-ciphered text, at the bottom signatures (amongst which ‘Philippus Melanchton’), accompanying cipher table.

D 4 Nr. 75.9: Hebrew-looking ciphertext on one page, something that looks like a cipher-poem on another; dedications, writings, and compositions sent by various individuals to Landgrave Philipp of Hessen-Butzbach from 1611–1630, 1637 & 1641. Amongst which cabbalistic writing and a book chapter overview by a Jew named Abraham from Worms (magical text).

D 4 Nr. 76.6: Multiple pages of partially ciphered text, related alphabet/key and nomenclature; but also a page that seems to be a pigpen cipher for/using Hebrew characters. Something that looks like a Trithemius table. A number-based nomenclature including related ciphertext; more pigpen ciphertxts and plaintext pages with lines in code. All in all, a plethora of cipher keys, either for the individuals’ personal use or potentially for learning purposes. In the 1641 *varia* of Landgrave Philip of Hessen-Butzbach, including a writing calendar for 1641, mottos, alchemical and kabbalistic writings (with a drawing of the hemisphere), cipher tables for names, tables for developing a secret script, notes on war events, a draft for a sundial, and an illustration of the town and fortress S. Mauro; belongs to D 4 Nr. 106/3.

4.2.3 Gotha Forschungsbibliothek

Chart. A 1014: Two lines that either use Hebrew as a steganographic device or use Hebrew characters as a code. In *Der alchemistische Nachlaß Friedrichs I. von Sachsen-Gotha-Altenburg*, 1727. 169 sheets in folio (Moeller, 1826, 382,1).

Chart. A 1017: Possible cipher table. Medieval alchemical manuscript in Latin and French (Moeller, 1826, 382,3), mostly texts by Raimund Lull, 167 sheets; described in detail in Wunderle (2002, 65ff.).

Chart. B 1156: Six pages with some coded lines and a list resembling a cipher alphabet. Circa 1455 from Johann Baptist von Seebach’s collection, mostly short recipes for alchemical processes, partially ciphered (Moeller, 1826, 81); described in Wunderle (2002, 370ff.).

Chart. B 1188: Numbers 0–9 associated with pigpen-style symbols. Late 17th-century manuscript with several processes and authors named, 376 sheets, multiple hands (Moeller, 1826, 384,r).

Chart. B 1393: A few lines of code, possibly pigpen, but faded, in a copy of Kenelm Digby, *Auserlesene philosophische Geheimnisse* (Hamburg 1684), 334 pages including index, one hand, bound in parchment (Moeller, 1826, 383,6).

Chart. B 246: Partially coded and symbol-laden two-page text about an alchemical furnace. 17th and 18th-century alchemical collection, 124 numbered sheets (Moeller, 1826, 379,2).

Chart. B 255: Two cipher alphabets in the margins of a plaintext letter. 17th/18th-century Italian manuscript with a code key, 119 sheets, referencing Lull, Geber and Paracelsus (Moeller, 1826, 380,6).

Chart. B, 256–257: Partially ciphered lines which seem to be part of the explanation of a code system. 18th-century manuscript stating to be copied from an unreadable template (Moeller, 1826, 380,7–8).

Chart. B 368: The inside of the book cover and flyleaf are filled with partially faded notes, amongst which seems to be a short cipher. *Kunstabuch*, 1571, in German. *The hidden art and work of preparing the tincture*, including: Rupecissa, apparatus sketches, Mediolan, drawings, *Practica Ruperti* (of Constantinople). (Moeller, 1826, 383,3)

Chart. B 370: Nomenclature of alchemical characters (although mostly not the common symbols). Process book, early 16th century, approximately 180 pages with registers, apparently also older fragments (Moeller, 1826, 383,5)

- **104:** Diverse papers (1 box, roughly sorted) containing text in Friedrich’s hand.
 - **2:** 8 pages of text in which many lines are coded. Booklet 10 x 16 cm, 111 pages. Inc. 1681 *Timor Domini*. Contains a compilation of alchemical authorities on the dry path, dated June 22, 1682.
 - **18:** Table beside text on *Aurum potabile*. Small booklet, 9 x 15 cm. Various alchemical processes, with 3 slips of paper attached.
 - **22:** *Clavicula salomonis* containing a few ciphered sections. Kabbalistic texts and horoscopes. 3 loose, but related sheets.
 - **23:** Number table, likely for divination. Small geomantic booklet, 17 x 20 cm, 11 written pages.
 - **24:** Alphabet for monoalphabetic substitution. 4 unbound writings, including the cabbalistic text: *Semi Phoras*, 4 pages, 17 x 20.5 cm. *Semi Phoras*, [6] pages, 21 x 34 cm. Inc. *Nomina imposuit Adam*, 2 written pages (numbered 26–27), 17 x 21 cm. Slip of paper, folded to 17 x 20.5 cm. Inc. ‘ob die LAMBDA sache gegen Michaeliÿ werde ihren anfang genomen’.
 - **26:** Nomenclature linking number combinations to words, seems to be for included correspondence. In a small book, 9.5x16 cm, bound in leather, incl. key to outgoing correspondence.
 - **27:** Nomenclature in small book, 10x16 cm, bound in leather, incl. key to outgoing correspondence.
- **73:** Upside down page with potential cipher alphabet. In *H. Friederichs I Chymische Correspondenz* Vol. II, Sammelband, 20 x 34 cm, 399 sheets, containing 8 unbound sheets. Correspondence concerning curiosities and alchemical texts, primarily 1688–1690, including drafts for fireworks, note fragments by Friedrich I on alchemical processes, expenditure, astrological notes, code keys, and laboratory plans.
- **73^{'''}**, 1 and 9: multiple cipher alphabets, probably as instruction or an exercise.
- **79:** *Nihil occultum quod non reveletur* (‘There is nothing occult, which will not be revealed’) followed by two lines of ciphertext. In *De origine et compositione Lapidis Philosophorum* (1598–1603), a manuscript bound in parchment musical notation, 16 x 20.5 cm,

⁸D4: <https://arcinsys.hessen.de/arcinsys/detailAction.action?detailid=b3916>

contains various alchemical processes and theories, including work by Wilhelm Ouerlackner (probably Georg Schwalenberg in Fritzlar). Notable entries include the first chapter on the origin of metals and their generation (dated 1603), *Theorica de auro vel lapide Philosophico* and *Practica Rogerii Baconis de Sole*.

- **80:** Two pages with a few coded lines and many alchemical symbols. In *Prozeßbuch* (1580), process book bound in cardboard, 17 x 21.5 cm, containing excerpts from the works of Johann Marcelli Hessen van Regensburg and mentions of various alchemical practitioners including C.F., Peter Senffeneder, Balthasar Rennschaff, and Sebastian Eibenauer.
- **95:** Multiple cipher alphabets. In Herzog Ernst Ludwigs zu S. Meiningen *Chymica* Vol. II (1694–1709), a folder of bound correspondence, max. 23 x 35 cm, containing 140 pages of various alchemical processes, calculations on expected profits, and curious chemical writings. It includes contracts with alchemists and inventories of laboratory equipment.

4.2.4 Hamburg, Staats- und Universitätsbibliothek

Cod. alchim. 651: A German poem entitled *Thorough Summary of All Celestial Influence*, making intriguing claims about alchemists at the court of Emperor Rudolf II (1552–1612). The supposed author, Martinus de Delle, a fictional court poet and adept, is likely a result of textual corruption. Both the prose introduction and the verse contains ciphered passages (Prinke and Zuber, 2020, esp. 418).⁹

4.2.5 Heidelberg Universitätsbibliothek

Codex Palatinus Germanicus 597: The manuscript, *Alchymey Teuczsch*, was composed over several years starting in 1426 by a group of alchemists in eastern Bavaria, possibly under the patronage of the Bishop of Passau (Rec, 2014, 4). *Alchymey Teuczsch* includes texts on medicine—some involving magical practices—and astrology. However, only the alchemical sections are encrypted (single words or entire recipes).¹⁰

⁹Some of the ciphered sections are included as images in Prinke and Zuber (2020). The similarity of many symbols used in the code to standard alchemical symbols and each other suggests that copyists may not have rendered them distinctly, complicating efforts to decode them. For example, well-known symbols like the Luna symbol (☾) were sometimes mixed up with letters ‘d’ by later scribes. Since Prinke and Zuber will not continue publishing on this, they passed down their research materials to the authors of this survey. From the HistoCrypt community, George Lasry and Richard Bean have consulted on these ciphers in the past but, up to this point, to no avail. The plaintext language is likely early modern German, which may have complicated the decryption process. We have not yet attempted employing historical language models (Megyesi et al., 2020; Sikora, 2022).

¹⁰The group was led by Nicholas Jankowitz, assisted by at least two collaborators, Michael von Prapach and Michael Wülfing, and a laboratory assistant named Friedrich. Jankowitz and his team employed three different cipher alphabets to encode parts of their work, concealing individual words and sometimes entire recipes. Eis (1982) has suggested that these ciphers were developed to ensure that the perfected recipes remained confidential within their laboratory, thereby preventing them from falling into the hands of rival practitioners.

4.2.6 Kassel Bibliothek

2° Ms. chem. 4: One page in which symbols are correlated to numbers, however, the mechanism seems not to be completely trivial. 2° Ms. chem. 4: *Donum dei*, German, 1520–1527.¹¹

4° ms. philol. 10: Cipher alphabets explained in this copy of *Steganographia nova* by Friedrich von Öttingen-Wittgenstein, wrongly attributed to Johannes Trithemius (1462–1516).¹²

2° Ms. chem. 19: About 50 pages of code, possibly for practice. Some words in recipes are in code, according to the catalogue in order to ‘make them more mysterious’ (Wiedemann and Broszinski, 2011). It is suggested German or Latin words were written using Greek or Hebrew letters as replacements.¹³

4.2.7 Rudolstadt Staatsarchiv

Kanzlei Arnstadt 404: Multiple pages where plaintext is interspersed with words in code, some pages are partially ripped out or words blackened. Letters addressed in German to ‘Monsieur’, with salutations in French. On some pages, alchemical symbols are drawn over the codes in pencil, likely an attempt to solve the code. Letters to Prince Anton Günther, 1689–1700s.¹⁴

Kanzlei Arnstadt 407: Some coded words within plaintext in letters from alchemists to Count (Prince) Anton Günther II, dated 1684–1714.

4.2.8 Weimar HAAB

Fol 96: One page with a pigpen cipher, another contains a table in a different system. Nuremberg curiosities (*Nürnbergischer curiosia*), 1663. Extensive collection of remarkable things, curiosities, theological, historical, philosophical, legal, alchemical notes, etc., including a series of songs and poems, collected with special reference to Nuremberg, presumably by Hanns Münchner of Nuremberg.

Oct 106: Multiple pages in which little drawings seem to be correlated to letters as a sort of alphabet or nomenclature. The drawings are repeated, albeit with different coloured backgrounds.

Q 454.4: A square table containing circles, symbols and letters, titled *Tabella Rabellina Solomonis*. Magical manuscript, *Three Books of Magical Wisdom*, the date is ciphered in Hebrew.¹⁵

Q 456: On a page titled ‘Archeus’, an acrostic poem spells out ‘ALCHIMIA’ through the first letter of each line (in red ink) in an alchemical composite manuscript (*Sammelhandschrift*).

¹¹2° Ms. chem. 4: <https://www.handschriftencensus.de/23834>

¹²4° ms. philol. 10: https://orka.bibliothek.uni-kassel.de/viewer/fullscreen/1486550062531/29/LOG_0027/

¹³2° Ms. chem. 19: <https://orka.bibliothek.uni-kassel.de/viewer/fullscreen/1486550062531/27/>

¹⁴Kanzlei Arnstadt 404: <http://www.archive-in-thueringen.de/de/findbuch/view/bestand/25960/systematik/132824>

¹⁵On the Pseudo-Solomonic, Pseudo-Hebrew tradition of Kabbalah-inspired magic, see Gannon (2020).

Q 458.3,4,5,6: Related text to Weimar Staatsarchiv, A XIV 20, alternating between Arabic and Latin, mentioning ‘AUGUSTUS ERNESTUS’ and ‘Sachsen’; may be the translation of a dedication. One line in Hebrew or code related to Hebrew letters. Dated 1740, contains *Clavicula Salomonis*.

4.2.9 Weimar Staatsarchiv

A XIV 20: Latin-Arabic text, might just be a translation. Since the Latin text below each line is about the prince, it may just be a dedication of a book given as a present from abroad. Letters by Heinrich Gottlieb Reime, Paul Valtin Reiss, Carl Philipp Raidel and related correspondences, 1738–1746. Großherzogliches Hausarchiv (Ernst August).¹⁶

A XIV 24: A few symbols on a title page, likely Cabbalistic. Correspondence 1738–1747.

A XIV 4: Ciphertext in geometric style (1 page), drawings on the opposite page make it seem like a pigpen variant. *Collectanea alchemica*, 1493–1747, 313 pages.

A XIV 5b: Strange code made up of five characters, repeated multiple times on one page. Alchemical signs to prevent theft, ca. 1700–1750, 11 pages.

4.2.10 Wolfenbüttel HAB

80-4-aug-8f: One line of ciphered text. Alchemical composite manuscript, 15th century, paper, 105 pages, 14.5 × 10.5 cm.¹⁷

4.2.11 Wolfenbüttel Staatsarchiv

2 Alt 2211: Simple substitution alphabet dubbed ‘philosophisches Alphabet’. Inquiry of Hermann Sprenger’s clandestine visit to Wolfenbüttel and related alchemical notes, 1573–1574.¹⁸ He had been invited by Philipp Sömmering, an individual known from debates revolving around the notion of ‘alchemical fraud’ (Nummedal, 2007).

4.3 Israel

4.3.1 National Library Jerusalem

Ms. Ed. 7: Page with German text related to Basilius Valentinus contains a pigpen-style enciphered word. Since the word before it is ‘Hungarian’, the enciphered term probably denotes a place and/or a substance to be found there. Neatly written manuscript copy, on 330 pages, with several pen-and-ink drawings in the text. Folio, contemporary marbled wrappers. Copied by Franciscus Cling in Berlin, 1747. Alchemical anthology from 1554, *Testament oder Morgen Roethe und Heiligen blutigen Steinem in demn alla glanzenden Crystalligen Sulfurigen durchscheibe und Salis Petra Philosophorum von Niter*, 329 pages.

Ms. Ed. 7.2: Chemical notes from Germany, dated 17th century, include three pages of partially enciphered text in simple symbols.¹⁹

¹⁶**A XIV 20:** <http://www.archive-in-thueringen.de/de/findbuch/view/searchall/Gro%C3%9Fherzogliches+Hausarchiv+/bestand/27222/systematik/130157>

¹⁷**80-4-aug-8f:** <https://diglib.hab.de/?db=mss&list=ms&id=80-4-aug-8f>

¹⁸**2 Alt 2211:** <https://www.arcinsys.niedersachsen.de/arcinsys/detailAction.action?detailid=v3961504>

¹⁹**Ms. Ed. 7.2:** https://www.nli.org.il/en/manuscripts/NNL_ALEPH990038366820205171/NLI

4.4 Italy

4.4.1 Brescia Library

IIV.31: Cipher alphabet in multiple lines (starting with the plaintext letters in the first row), some symbols for specific terms. In *Secreta secretorum philosophorum*, a manual of alchemy from the late 16th or early 17th century, featuring various recipes for metal transmutation and herb distillation.

ms.I.V.13: Contains a symbol code, potentially a form of shorthand, interspersed with alchemical symbols (1 page) from the second half of the 17th century. In what is described as one of the oldest and most complete examples of the *ABRAMELIN*, a famous esoteric grimoire attributed to a legendary Egyptian mage Abraha-Melin, or to Abraham of Worms or Würzburg, a German Talmudic Jew from the 12th or 13th century; likely composed during the 14th century in the Balkan region, only a few known copies.

4.4.2 Marciana Library

Italian II. 152 [5046.]: 1 page containing hard to read text (not ciphered), combined with symbols (potential cipher). Line drawings accompanied by 4-letter combinations each, labelled ‘litera egittiaca’ and ‘Numeri Egittij Hyeroglyphici’, however, they are definitely not Hieroglyphic numerals (2 pages). Paper, quarto, 16th century. *Opusculum alchimiae auri et argenti*.

4.5 Netherlands

4.5.1 Allard Pierson

PH344: 5 pages of partially enciphered text, all with the same alphabet. One page contains a table called ‘Die erste Tabelle des Königs Xophor’ (‘The first table of King Xophor’) Basilius Valentinus’ *Das große Geheimniß der Egyptischen Könige*, dated to the 1700s.

4.5.2 Leiden UL

Cod. Voss. Chym. Q. 51: This *Liber de magna alchymia* lists several alphabets, existing and fictional, ranging from Greek and Egyptian to Chaldean and even angel symbols. Foreign scripts are heavily adapted through scribal modifications or transmission errors (Gannon, 2019).²⁰

VCQ 17: Cipher alphabet for monoalphabetic substitution with symbols often found in the context of alchemical ciphers. A 16th-century manuscript from 1588–95, 337 folios on paper, dimensions 212x164mm, featuring various works on alchemy including poems, operations, and dialogues in both Latin and German, including *Rosarium philosophorum sive Donum Dei*, *Splendor solis*, Pseudo Roger Bacon, Pseudo Thomas Aquinas, Bernard Trevisan, Johannes Aurelius Augurellus, Pseudo Alexander von Suchten, Pseudo Raimon Lull, Paracelsus and Pseudo-Paracelsus.

4.6 Norway

4.6.1 National Library Oslo

Ms.8° 32321 1702: A manuscript (*Libellus singularis*) that includes a substitution cipher, in which letters seem to be substituted for numbers, on the back side of the title page, 1702.²¹

²⁰The Viennese ÖNB Cod. 11133 also contains comparable alchemical alphabets.

²¹**Ms.8° 32321 1702** https://beta.nb.no/dhlab/privatarkiv_navn/

4.7 Russia

4.7.1 State Library Moscow

183.1082: Pigpen cipher table within masonic manuscript, written in French from the mid-18th century.²²

183.1426: French 18th-century manuscript with a cipher table and a partially enciphered passage about Roger Bacon (where ingredients would follow: ‘il faut prendre...’), 281 folios. *Recueil de divers traits de la Philosophie Hermetique, composees par divers maitres dans cette science*. Contains Arnald of Villanova, Paracelsus (on *Electrum*, see Gannon (2023)) and P.-J. Fabre.

183.943: Page mentioning ‘Theophrastus’ with symbol-encoded text in a manuscript titled *Tinctura universalis* in German Gothic script from the 18th century, 78 fol.

183.998: German text (*Tabula Smaragdina*, 2 pages total) with a portrait of Hermes Trismegistus holding a ciphered table. In *Reichversammlung und Stimmen der berühmtesten Philosophen von der Sündflut an bis auf unsere Zeit über die höchste Geheimnis der Natur, sonderlich ihres großen Steins*. 1663.

4.8 Sweden

4.8.1 National Library Stockholm

Fa. 14: 5 pages of plaintext containing runes, some aligned in a way that makes them look like potential substitution alphabets. Different alphabets arranged in table formats (5 pages), the page heading mentions Johannes Trithemius. In a manuscript related to the idea of Goths as keepers of ancient wisdom with runes having ‘double’ meanings and sacred significance, similar to the Hebrew Cabala and Egyptian hieroglyphs.²³

Fa. 2: Titled *Azotica Astronomia*, the text contains a few enciphered words. Beside it there is a cipher table, potentially for polyalphabetic substitution but also containing many symbols familiar from other ciphers in alchemical contexts. Reflects Bureus’ interest in alchemy from early 1604, noting key ideas from medieval classics and works of Paracelsus, Gerhard Dorn, and Andreas Libavius.²⁴

Huseby 78: An Old English manuscript from 1550 with various recipes includes an alphabet for simple substitution cipher and a few enciphered words.

Rål. 9: A text titled ‘mysteries of the alphabet’, appears to contain cipher instructions within Swedish text. In Johannes Bureus, *Adulruna Rediviva seu Sapientia Sveorum Veterum*.²⁵

X113: List and table of syllables (2 pages), could be just a writing exercise. From a late 15th-century German medical book.²⁶

²²**183.1082:** <https://viewer.rsl.ru/ru/rs101004721310?page=1&rotate=0&theme=white>

²³**Fa. 14:** <https://lucris.lub.lu.se/ws/portalfiles/portal/2285913/3809108.pdf>

²⁴**Fa. 2:** <https://lucris.lub.lu.se/ws/portalfiles/portal/2285913/3809108.pdf>

²⁵**Rål. 9:** <https://lucris.lub.lu.se/ws/portalfiles/portal/2285913/3809108.pdf>

²⁶**X113:** <https://kortkataloger.kb.se/hsnominal/20647/>

4.9 UK

4.9.1 Edinburgh Royal College of Physicians

DEP ERG 5 1-5-1-23: Potential cipher table below text in Italian. Alchemical manuscripts of George Erskine, titled *Arbatel – The magik of the auncient Philosophers*, dated 13 Feb 1602, with aphorisms and possibly in Erskine’s own writing.²⁷

4.9.2 Edinburgh University Library

MS. Dc.1.30: *Medulla* cipher discussed in Piorko et al. (2023) containing the Bellaso/Vigenère/Della Porta cipher table, enciphered text, key and plaintext; plus one number wheel to calculate the days of the alchemical work.

4.9.3 Glasgow University Library, Ferguson Collection

Ferguson Ms. 114: Brief note in cipher or shorthand on one page. 18th-century alchemical manuscript with various tracts including *The Praxis of Meriam* and *Sir George Ripleys Epistle to King Edward unfoulded*.²⁸

Ferguson Ms. 130: Ciphertext based on alchemical symbols (two pages with each one paragraph, one line on another), cipher table with one symbol per letter. 18th-century French manuscript, *Oeuvre du philosophe Solidanius*, featuring colored hermetic figures and sections in code, 55 folios, 205x156mm.

Ferguson Ms. 19: Nomenclature alphabet encoding alchemical processes. 17th-century Spanish manuscript with Italian section headings, including *Cedula ritrovata* and *Elucidarius Christophori Parisiensis*, 52 folios, 215x142mm.

Ferguson Ms. 191: One coded block in the margin of one page. 17th-century English manuscript with Latin verses, including Thomas Norton’s *The Ordinall of Alchimy*, 207x147mm, 52 folios.

Ferguson Ms. 262: French text contains a cipher alphabet under the heading ‘Alphabet cryptographique’. The two pages seem to refer to another text (mentioning Nicolas Flamel) in which this cipher seems to have been used. 17th-century French manuscript, a copy of (Pseudo-)Nicolas Flamel’s writings, featuring horoscopes and planetary arrangements. ii folios + 36 pages + 4 folios on vellum. 159x108mm.

Ferguson Ms. 323: One page contains what seems to be a nomenclature. 16th-century English manuscript with alchemical receipts, diagrams, *Raymond Lullye’s alphabet*. 12 folios. 294x198mm.

Ferguson Ms. 4: Familiar circular drawing typical of *Buch der Heiligen Dreifaltigkeit*.

Ferguson Ms. 77: Caballistic table, relating letters to numbers. The heading contains the symbol for Mercury. 18th-century French manuscript with various alchemical treatises, including a depiction of Copernican cosmology and writings by Bernard Trevisan, Isaac Hollandus, Raymund Lull, Nicolas Flamel and *Traité de l’Or Potable*. 132 folios. 210x168mm.

²⁷**DEP ERG 5 1-5-1-23:** <http://archives.rcpe.ac.uk/CalmView/Record.aspx?src=CalmView.Catalog&id=DEP\%2fERG\%2f1\%2f5\%2f23>

²⁸**Ferguson Ms. 114:** <https://www.gla.ac.uk/collections/\#/details?irn=265726&catType=C&referrer=/results/&q=GB+114+MS+Ferguson>

Ferguson Ms. 94: Cipher table (1–2 symbols per letter), about 20 pages with partially or entirely encrypted text amongst French plaintext. 17th-century French alchemical and astrological notebook of A. Mereau, including sections in code, pen portraits, and drawings of alchemical apparatus. 190 folios (of which 54 are blank). 201x145mm. The manuscript features sections in code, with the key affixed to the inside front and rear covers. An astrology-focused section presents several horoscope charts. The cover bears coded words, followed by the inscription: “Elvoh a servez a la gloire de Dieu et au salut de [] ame A.M.”

MS Hunter 110 (T.5.12): Number and letter tables on one page. Alchemy compendium, late 14th century, in English hand, illuminated initials, pen and ink drawings, diagrams, and numerous marginalia. Includes works such as *Synonyma Alchemiae* and *Mappae Clavicula* (unknown authors) and Albertus Magnus.²⁹

4.9.4 London British Library

Sloane MS 1902: Astrological medical manuscript produced by John and Arthur Dee (Lang and Piorko, 2021; Bean et al., 2022; Piorko et al., 2023), containing the ciphertext *Hermeticae Philosophiae Medulla*, adjacent *tabula recta*, and cipher key (ff. 12–14).

Harley Ms. 2407: 110011101001010101 code on the left of one page. 15th and 16th century manuscript including various alchemical texts, poems, and treatises in Latin and English including Arnald of Villanova, and numerous alchemical drawings and preparations.

Sloane MS 3189: *The Book of Enoch* contains the fortune telling tables of John Dee, as scribed by Edward Kelley, later owned by Elias Ashmole. The angelic conversations (Shumaker, 1983; Harkness, 1999; Reeds, 2006) were communicated via encrypted angelic languages unique to each angel. Dee and Kelley used alpha-numeric *tabula recta* containing Enochian language symbols, which are also recorded in the codex.

Sloane 3604: 4 pages containing cipher wheels and multiple cipher tables. 16th Century manuscript in the hand of Robert Frelove, containing various alchemical treatises such as by Raymund Lull, 293 folios.

Sloane Ms 1118: One page with different cipher alphabets, including rectangles. End of the 15th Century manuscript with 33 items; paper, small quarto, 154 folios.

Cotton MS Vespasian A II (ff. 2–10, 27–40 1): Numeric/alphabetic cipher tables corresponding to the months of the year; geometric computational charts, and letter ciphers are all present in this Arabic astrological manuscript owned and annotated by John Dee.

Sloane MS 3687: Contains the alchemical processes of George Marrowe and others mentioned in Sloane MS 1902 related to the *Medulla* cipher (Piorko et al., 2023). After Villanova is referenced, the rest of the MS contains laboratory notes that include numeric ciphers referencing encrypted days of the week.

²⁹<https://www.gla.ac.uk/collections/\# /details?irn=296480&catType=C\&referrer=/results\&q=MS+Hunter+110+>

4.9.5 London Wellcome

Ms. 164: Circular drawing in which words are linked in mysterious ways in this copy of *Buch der Heiligen Dreifaltigkeit*.

Ms. 259: Text in Latin and Ancient Greek with religious contents, a two-line code of alchemical ciphers, marginalia with what could be Ashmolean shorthand; mapping of letters to numbers. 1649 manuscript by Petrus Almerigus Encherchz, written in a cipher of semi-Greek characters, with content focused on the secret chimica and the importance of discretion in alchemical pursuits. 1649 manuscript containing semi-Greek cipher recommending secrecy in the Work.³⁰ Further names follow in an unresolved cipher (pointing to members of an order).

Ms. 309: Several pages encoded by a monoalphabetic cipher consisting of 51 symbols (most letters are replaced by more than one symbol). The ciphertext spans the following pages: 7–10, pages 11–12 are missing, 13–20, 21, 26, 27, 28, 29. The rest of the text is in German. The cipher key is included. Some of the ciphertext pages contain drawings of alchemical vials and furnaces. In Johann Gerlach’s *Occulta scripta chymica* written in German at Gottersdorff in 1572 and Naunburg in 1575–1576. The 18th-century manuscript includes secret alchemical scripts, prayers, lists of ingredients, and alchemical and medicinal receipts. It is illustrated with water-color symbolic alchemical drawings, some heightened with gold, and is written partly in cipher. The relevant section is pp. 7–178 *Secreta alchemica* in cipher and German. There follows an ingredients list (called *Elixir vitae*) and another partly coded section pp. 179–209. A manuscript key for the 51-symbol code by Julius Kohn is included.³¹

Ms. 424: French text (seemingly an alchemical recipe) broken up by musical notes, which seem to be used as symbols for encoding words (2 pages). *LIBVRE accomply de secrets chimiques pour distillations*, [...] , a mid-17th century manuscript, 20 x 15 cm, containing astrological tables. It includes a section in Italian with some words in alphabetic cipher and features astrological diagrams and tables.³²

Ms. 447: Tables (structured as grids or lines), a circle mapping numbers to concepts (4 pages). A 16th-century manuscript (circa 1575), including small pen-drawn diagrams, figures, and drawings of alchemical apparatus,

³⁰<https://wellcomecollection.org/works/m4ka7d4g> Fol I (In a cipher made up of semi-Greek characters): Jesvs Et Maria Et / Ioseph. / (red) Uerba propria philosophorum auree cur/cis super secreta chimica Dei gratia / a fideli et dilectissimo amico mihi huani [?] / ter elargita pro cuius anima semper Deum / rogare teneor quoniam mihi testauit. Deum ideo Precor ut mihi concedat gratiam eadem / uerba cognoscere pro eius laude et gloria / pro salute anime mee, pro auxilio paupe / rum.et pro commoitate mee familie pau / pere [sic]. Amen. Translation: Jesus, Mary and Joseph. The peculiar words of the Wise of the Golden Cross about the secret alchemy of God’s grace were donated to me in a humanistic manner by a faithful and highly esteemed friend, for whose soul may God always care, as he has testified to me, which is why I adhere. Therefore, I pray to God to bestow the grace to understand these words for His praise and glory and for the salvation of my soul, to aid the poor, and for the benefit of my poor family. Amen.

³¹<https://wellcomecollection.org/works/qb3carav>

³²<https://wellcomecollection.org/works/ja2s52se>

with the text within red rules and written in ‘caractres de civilie’.³³

Ms. 3563: *Miscellanea Alchemica XXI*, 1746. This composite manuscript is written in a personalized alchemical shorthand containing alchemical and astrological symbols to be used for practical experimentation. The text of *Smaragdina Hermetis Tabula* is partially coded (ends p. 58).³⁴

4.9.6 Manchester Rylands

German MS 1: A 15th-century manuscript titled *Alchemica* illustrated with colored drawings and texts of alchemical subjects, written in Bavarian dialect. Contains a cipher alphabet on a page with faded text.³⁵

German MS 3: An 18th-century collection of alchemical writings titled *Sammlung Alchymistischer Schriften* originating from Germany. Features partially enciphered text with a key (*clavis*) and encoded parts highlighted in red.³⁶

Latin MS 65: A 15th-century Italian alchemical miscellany with a cipher table (possibly polyalphabetic), a page of nomenclature, and a *tabula Mercurii*.³⁷

4.9.7 Oxford Bodleian

Ms. Ashmole 1408: Ciphertext and two lines of substitution alphabets. An early 17th-century manuscript from Richard Napier’s collection, containing excerpts from classical authorities like Geber, Roger Bacon, Paracelsus, notes on Lull and more; with a ciphertext and substitution alphabets. Includes various alchemical experiments, poems, and treatises in English and Latin. Also containing an alleged chymical experiment by Johannes Trithemius in his own hand.

Ms. Ashmole 1420: Lines and marginalia in code, possibly Ashmole shorthand (Josten, 1967). Lines and marginalia in code, possibly Ashmole shorthand. The 17th-century manuscript includes works by Avicenna, Maria Prophetissa, Edward Kelly, George Ripley’s *Medulla, Rosarium philosophorum* and more.

Ms. Ashmole 1459: Enciphered paragraph and marginalia, possibly Ashmole shorthand (Josten, 1967). The 16th and 17th-century manuscript includes Ripley, Lull, and English alchemy; 324 folios.

Ms. Ashmole 1440: Contains two pages titled ‘riddles’ with a paragraph in code, likely Ashmole shorthand (Josten, 1967). The manuscript includes notes and tracts on alchemy in Latin and English, including Quercetanus and Dee’s *Monas Hieroglyphica*.

MS. Ashmole 1441: Brief notes in symbols, probably Ashmolean shorthand. The manuscript *Liber collectaneorum de arte alchemica* consists of a collection of alchemical papers and fragments by Ashmole, the Napiers, and others.

³³<https://wellcomecollection.org/works/c827npxm>

³⁴**Ms. 3563:** <https://wellcomecollection.org/works/upqex4fa/items>

³⁵<https://www.digitalcollections.manchester.ac.uk/view/MS-GERMAN-00001/1>

³⁶<https://www.digitalcollections.manchester.ac.uk/view/MS-GERMAN-00003/1>

³⁷<https://www.digitalcollections.manchester.ac.uk/view/MS-LATIN-00065/1>

Ms. Ashmole 1445: Enciphered notes in the margins of multiple pages; words on one page and complete sentences are meticulously cut out of the paper. The manuscript includes Ripley’s *Compound of Alchemy, Coelum Philosophorum*, Arnald of Villanova, Raymond Lull and various alchemical works and poems.

Ms. Ashmole 1459: Enciphered paragraph and marginalia, may be Ashmole shorthand (Josten, 1967).

Ms. Ashmole 1479: Contains a cipher table and wheel, and one page of hard-to-read handwriting that may be partially enciphered. The 16th-century manuscript scribed by Rychard Walton includes works by George Ripley (*Twelve Gates, Marrow*), Raymond Lull, and others on alchemical topics.

Ms. Ashmole 1487: Features enciphered words and marginalia in a passage on Paracelsus. The 16th-century manuscript includes various alchemical texts, such as works by Paracelsus, Hermes Trismegistus, Mary the Prophetess, and others, encompassing theories, practices, and poems in English.

Ms. Ashmole 1490: Italian text headed ‘Zifra’, paragraph looking like Ashmole shorthand (Josten, 1967), cipher table (listing mostly different synonymous alchemical symbols) and seemingly a Trithemius table. The 16th and 17th-century manuscript includes a diverse collection of medical, chemical, and astrological pieces, alchemical texts, and dialogues. The manuscript is a rich compilation of various recipes, tracts, and treatises in Latin, Italian, and English, including Lull, Paracelsus, Kelley; 358 folios.

Ms. Ashmole 1492: Enciphered page in Dee manuscript. 16th and 17th century manuscript, 109 pages + 18 + 14 folios + 211 pages including notes by John Dee and Richard Napier, with text in English, Latin and Dutch. Alchemical works such as Lull and Ripley, chymical recipes partly in German.

MS. Marshall 15: Table aligning letters with numbers, under the heading ‘To knowe whether a person doe tell the truth or not’, thus probably a divination context rather than ciphering. This late 16th-century manuscript from England comprises medical, chemical, and astrological pieces written in various hands.³⁸

4.10 US

4.10.1 University of Indiana, Lilly Library

LMC 2450, bound 11: Latin translation of eighth-century Jewish astronomer, Messahala, containing astrological tables, drawings of di, and multiple alpha-numeric tables and circular magical letter charts.

4.10.2 New Haven, Beinecke Rare Books Library

Mellon MS 108: 18th-century alchemical miscellany featuring four lines of symbol code. Compiled by Jan Pieter Rathlaan, the manuscript includes poems, teachings, and illustrations on alchemical subjects in German, Dutch, and Latin, including authors like von Hellwig. 140 folios, 312x197mm.

³⁸**MS. Marshall 15:** https://archives.bodleian.ox.ac.uk/repositories/2/archival_objects/175318

Mellon MS 309: Alchemical text from 17th-18th century Southern Germany, includes four lines of substitution cipher text made up of symbols. The manuscript features a wide range of texts, recipes, and alchemical illustrations, including Andreae, Arnald of Villanova, Morienus, Rases, Lull, Paracelsus, and Geber.³⁹

Mellon MS 34: 16th-century manuscript (ca. 1550), includes a Hebrew *Tabula Smaragdina* side-by-side with probably the same text in different symbols (possibly an unfamiliar language). Compiled by Johannes Baptista, it encompasses a collection of alchemical works by authors such as Arnald of Villanova, Geber and Rupecissa in Latin, Italian, and Spanish. 155 folios, 210x140mm.

Mellon MS 74: 18th-century manuscript with Old French text in which metals seem to be substituted by three-letter codes. The manuscript, titled *Livre de la très Sainte Trinité*, is a French version of *Buch von der Heiligen Dreifaltigkeit*, incorporating 19th-century illustrations. 212 folios, 396x261mm.

Mellon MS 86: 18th-century manuscript with additions from c. 1740, featuring two sets of two lines of symbol code within an Old French text. Authored by Salomon Trissmosin, it includes *La toison d'or* (Golden Fleece) and *La splendeur du soleil* (*Splendor solis*). 219 folios, 203x153mm.

Mellon MS 27: Alchemical compilation by Martin Roesel von Rosenthal (~1586), containing texts and recipes in Latin and German, partially ciphered (Rec, 2014).⁴⁰ This manuscript on paper comprises three parts, containing numerous practical procedures primarily alchemical, but also medical, along with standard medieval alchemical texts by Khalid ibn Yazid, Theodoric, and Albertus Magnus. Occasionally, passages in cipher, added by Martin Roesel of Rosenthal around 1586 – well after the main content was written – are present. The cipher appears to be a simple number-substitution type.

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³⁹**Mellon MS 309:** <https://pre1600ms.beinecke.library.yale.edu/docs/pre1600.ms309.htm>

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